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The Development of Non-Cognitive Skills in Adolescence

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The Development of Non-Cognitive Skills in Adolescence*

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Abstract

We use a unique longitudinal data set to study the development of non-cognitive skills in adolescence. We measure—for the first time—the development over six years of the recently introduced non-cognitive skill "Grit." We also measure the traditional Big Five personality traits. For Grit, we find significant within-person mean-level increases of about .5 standard deviation units for our sample of adolescent students. These increases are comparable with increases in the Big Five, where conscientiousness, agreeableness, and emotional stability also increase with similar magnitude. We show that these changes are heterogeneous and robust to reasonable measurement error.

Keywords: non-cognitive skills, Grit, Big Five personality traits, vocational education and training.

JEL Classification: I21, I26, J24.

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1 Introduction

Economists recognize the importance of non-cognitive skills for individuals' economic behavior and their labor market outcomes (Heckman, Stixrud, & Urzua, 2006), a recognition that has led researchers to investigate the formation and stability of non-cognitive skills. While most of the literature suggests that non-cognitive skills are stable during adulthood (Cobb-Clark & Schurer, 2012), there is hardly any evidence on the formation and malleability of these skills during adolescence. This lack of research is surprising, because many personality traits appear responsive to policy interventions and educational investments (Almlund, Duckworth, Heckman, & Kautz, 2011). However, measurement issues and the lack of high-quality data have prevented researchers from providing definitive answers. Our paper intends to fill this research gap.

We use unique panel data that measures adolescents' non-cognitive skills with well-established multiple-question inventories to study the formation and malleability of non-cognitive skills. We focus on two types of non-cognitive skills: Grit (i.e., the perseverance and passion for long-term goals) and the Big Five personality traits (i.e., conscientiousness, extraversion, agreeableness, openness, and emotional stability). While studying the Big Five has a long tradition in economics and psychology, research on Grit started only in 2007 with the establishment of a reliable scale (Duckworth, Peterson, Matthews, & Kelly, 2007). Grit has attracted researchers' interest, because studies have shown it to be highly predictive of labor market success as well as of other life outcomes (Eskreis-Winkler, Shulman, Beal, & Duckworth, 2014). As early as 2009 we have started a longitudinal data set that allows us to study the development of Grit among adolescents over a six-year period. In our analysis, we focus on the development of Grit and compare it to the development of the Big Five.

The present study contributes to the literature by answering the following three questions: (1) Do Grit and the Big Five change during adolescence? (2) Are changes in these non-cognitive skills heterogeneous across individuals? (3) How much of the change is reliable under reasonable assumptions on measurement error?

2 Research Design

To study the development of non-cognitive skills during adolescence, we use a unique panel data set, which provides us with repeated measures of Grit and the Big Five.[1] We derive the measures of non-cognitive skills from standard multiple-question inventories. For Grit, we use the 8-item Grit scale, a highly efficient full-sentence questionnaire developed in Duckworth and Quinn (2009).[2] To the best of our knowledge, ours is the first data set that provides repeated Grit measures over a period spanning

[1] For a detailed description of the data see Oswald and Backes-Gellner (2014), who use early waves of the data to investigate the education production of grades.

[2] Grit, however, while characterizing the passion for long-term goals, is not merely a measure of time preferences: the correlation between the Grit measure and experimentally elicited time preferences in our data is only .1.

several years, and, therefore, is the first that allows to study the development of Grit over such a long time span and for adolescents.

For the Big Five, we use the established 3-items-per-trait scale, based on the original Big Five Inventory (BFI) scale and further developed in Gerlitz and Schupp (2005). To assess the Big Five, the BFI scale uses short-sentence questions, which John, Naumann, and Soto (2008) argue are less ambiguous and provide more consistent answers than the frequently used sets of adjectives (e.g., in Cobb-Clark & Schurer, 2012, and, Elkins, Kassenboehmer, & Schurer, 2016).

We use a sample of adolescents because psychologists, who have intensively studied the development of personality over the life span (Costa & McCrae, 1994; Roberts, Walton, & Viechtbauer, 2015), suggest that adolescence is a critical phase in that development. During adolescence, individuals are usually enrolled in educational programs. Therefore, when studying the development of non-cognitive skills during adolescence, we have to take education into account.

A natural place to start studying the development of non-cognitive skills is vocational education and training (VET). VET has at least three characteristics that may foster the effective development of non-cognitive skills in adolescence: it is well-structured, provides close mentoring, and has labor-market proximity (Heckman & Mosso, 2014; Kautz, Heckman, Diris, ter Weel, & Borghans, 2014). Moreover, VET is the main path of education in many parts of western Europe and is becoming increasingly important in the UK and the U.S. We use a sample of adolescents who were enrolled in a VET program in Switzerland, a country where 70 percent of every cohort choose VET (Hoffman & Schwartz, 2015). The program, which starts around age 16, lasts three to four years and combines one to two days per week of classroom learning in a vocational school with workplace-based training in a host company (Wolter & Ryan, 2011).

We collected baseline measures at age 15-16 and final outcomes at age 21-22. The initial sample in 2009 consisted of 265 individuals, of which 255 provided measures of non-cognitive skills. In the final wave, six years later, 159 individuals responded to our survey efforts (via e-mails, letters, phone calls, and social media) and 153 individuals provided measures of non-cognitive skills. The overall attrition is 40 percent and is unrelated to baseline non-cognitive skills and various background variables (see table A1 in the online appendix). Given that we focus on changes over time, we base all our analyses on the subsample of individuals with valid measures of non-cognitive skills at both points in time.

3 Results

3.1 Average Within-Person Changes

To examine our group of individuals over time, we start by investigating average within-person changes. Table 1, column 1 provides means and standard deviations for the baseline score, the final score, and the within-person change over time. We estimate a significant average increase for Grit of about .5 standard

deviation units of the baseline score (table 1, column 2). For the Big Five, we estimate similar significant increases for conscientiousness and—to a lesser extent—for agreeableness and emotional stability.

[Table 1 here]

Moving towards a distributional analysis, Figure 1 depicts the probability density functions at the two points in time (2009 and 2015). For Grit, Figure 1 shows that the mean-level increase is the result of a parallel shift of the distribution to the right. These developments could be the result from either of two mechanisms: first, a homogeneous increase (i.e., each individual develops in the same positive way) or, second, heterogeneous changes over time (i.e., individuals experience both positive and negative changes, with the positive outweighing the negative on average). For the Big Five, we observe similar developments for conscientiousness, agreeableness, and emotional stability.

[Figure 1 here]

By investigating the first potential mechanism, we find that the mean-level changes are not the same for all individuals. Although the mean-level change in Grit is sizable, the two scores over time appear only loosely correlated at .3 (table 1, column 3).[3] For the three Big Five traits with significant mean-level changes, we find very similar results (table 1, column 3). Moreover, while openness shows no mean-level change, it appears to be unstable at the individual level (table 1, column 3). In sum, Grit and some of the Big Five, primarily conscientiousness and—to a lesser extent—agreeableness and emotional stability are unstable during adolescence, with significant average within-person increases. This changes cannot be explained entirely by the correlation between the measures over time, leaving us with the second explanation: individuals experience heterogeneous changes over time. We investigate this hypothesis in the next section.

3.2 Heterogeneous Within-Person Changes

To investigate the heterogeneity in within-person changes, we depict the density functions of the within-person changes over time in Figure 2. For Grit, we clearly find that the development is heterogeneous during adolescence. Although the density mass of the changes is positive, some individuals show negative growth in Grit. While this general pattern also holds for the Big Five, the distribution of Grit change shows fatter tails. Grit thus appears to develop even more heterogeneously than the Big Five.

[Figure 2 here]

Another way to investigate the heterogeneity in changes is by using a transition matrix. Table 2 presents the transition matrix between 2009 and 2015 for the ranges of percentiles 0-20%, 20-40%, 40-60%, 60-80%, and 80-100%. For Grit, this matrix shows that a substantial share of individuals changes

[3] Rank correlations over time are close in magnitude to the correlation coefficients in Table 1, column 3.

the position in the distribution. About 73 percent of the individuals are off the diagonal, i.e., they are in different quintiles of the distribution at the two points in time. Moreover, we observe that almost all cells are filled, suggesting that individuals move quite heterogeneously. For the Big Five, we find similar results.

[Table 2 here]

The heterogeneous development of non-cognitive skills could be partly—or, in the worst case, entirely—explained by measurement error. Given our sample size, this is a potential threat and the next section tests the robustness of out results with respect to measurement error.

3.3 Measurement Error and Reliability of Changes

A major issue when investigating changes in skills over time is measurement error. One might think that the early score is correct, the real score is stable, and all change over time is just measurement error. Even more detrimental, both scores might be measured with error. Because measurement error is a serious problem particularly in small samples, we need to know if our results are purely driven by noise and how much of the change is actually reliable. To deal with measurement error issues, we use a "reliable change index," which accounts for reasonable levels of measurement error, to investigate average changes, and, further add noise to Figure 2 (previously discussed) to investigate the heterogeneous changes.

To understand how much of the observed change is reliable, we borrow from the clinical literature and estimate reliable change indexes. Jacobson and Truax (1991) define a reliable change index (RC), which corrects any observed change for a reliability coefficient (r).[4] If the scale produces only measurement error, r will be equal to 0 and no reliable changes would exist. On the contrary, when the scale entails no measurement error at all, r will be equal to 1 and all changes would be reliable. We follow the approach by Jacobson and Truax (1991) and rely on typical reliability coefficients which range around .8 (John et al., 2008).

We find that for Grit 30-40 percent of the individuals change in a reliable way, either positively or negatively. Even in our most conservative specification ($r = .7$), at least 23 percent of the sample actually experience a reliable increase (table 3). We also find substantial shares of individuals with reliable increases for conscientiousness, agreeableness, and emotional stability (table 3).

[Table 3 here]

The intuition behind the RC index is that small changes in non-cognitive skills are likely measurement error and thus are unreliable. However, assuming that all small changes are unreliable and setting them to zero would have no strong effect on the heterogeneity of changes. We can instead obtain a

[4] $RC = \frac{x_2 - x_1}{\sqrt{2(s_1\sqrt{1-r})^2}}$, with s_1 being the standard deviation of the baseline score. We test $RC = 0$ with a t-test.

graphical representation of the impact of measurement error on the full distribution of changes by simulating counterfactual distributions of changes under different levels of error in the data. To do so, we duplicate our initial data set 1,000 times and, in each duplication, we randomly draw the individuals whose change is unreliable.[5] After repeating this replication exercise for different levels of error, we plot the new distributions of changes.

Figure 3 is a graphical representation of how the distribution of change in Grit varies with different levels of error in the data. The figure shows the changes in counterfactual measures, compared to the observed change. Figure 3 suggests that increasing measurement error reduces the heterogeneity in changes but this heterogeneity does not completely disappear. Again, we find similar results for the development of conscientiousness, agreeableness, and emotional stability.[6]

[Figure 3 here]

Overall, we conclude that measurement error only partially explains the heterogeneous development of Grit and the Big Five components conscientiousness, agreeableness, and emotional stability. These findings suggest that Grit and three of the Big Five change during adolescence and that the change—although positive on average—appears to be heterogeneous across individuals.[7]

4 Conclusion

Given the labor market relevance of non-cognitive skills, economists need to understand whether these skills change over time and, if so, how they are malleable. Our results show that a particular set of non-cognitive skills increases on-average during adolescence: Grit and three of the Big Five personality traits (conscientiousness, agreeableness, and emotional stability) substantially improve between the ages of 15 and 22. However, these changes are heterogeneous, which is surprising given our homogeneous sample. Moreover, these changes are robust to reasonable assumptions about measurement error.

In contrast to other studies, we find substantial changes in non-cognitive skills over time. Elkins et al. (2016) only investigate individuals enrolled in general education and conclude that personality (measured roughly by sets of adjectives) is rather stable for adolescents while in school. For a similar age group, we investigate students enrolled in vocational education and training to investigate whether work-based learning may have different effects. Thus, our results suggest that work-based learning

[5] In practice, we implement the following two-step procedure. First, for a given proportion of the sample (i.e., $1 - r^2$) we substitute the observed values (initial and final value) with random draws from a uniform distribution between zero and one. Second, we bootstrap our initial data set 1,000 times and, in each replication, randomly select the individuals who receive measurement error. As for the RC analysis, we set $r = .7$ and .8. Since we are interested in investigating the heterogeneity, we perform this analysis in a mean-preserving manner.

[6] We can also apply the RC correction to the transition matrix discussed previously. Intuitively, all small—and thus potentially unreliable—changes should lie on the diagonal of the transition matrix. The results, presented in Table A2 in the online appendix, show that the RC shifts mass from cells that are close to the diagonal to cells that are actually on the diagonal. Again, however, the correction does not eliminate entirely the heterogeneity in changes.

[7] We also investigate the correlations between individuals' observable characteristics and the development of non-cognitive skills without finding any systematic relationships (see table A3 in the online appendix).

with its more varied types of learning experiences, including its hands-on learning in a real business environment with coworkers and customer interactions, plays an important role in the formation of non-cognitive skills.

Our results give first insights into the development of Grit during adolescence but also leave some questions unanswered. For example, due to our small sample size and limited variation in the training set-up, we are so far not able to explain the heterogeneity in changes by observable characteristics. In this regard, it would also be beneficial to investigate how different aspects of the learning environment in different types of education systematically affect the development of non-cognitive skills. Future research should address these questions by using large-scale longitudinal data sets. Given the importance of Grit and given that we show that it changes over time, including high-quality Grit questionnaires in large longitudinal data sets such as the National Longitudinal Survey of Youth (NLSY), the Household, Income and Labor Dynamics in Australia (HILDA), or the German Socio-Economic Panel (SOEP) would be particularly useful.

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Tables and Figures

Table 1: Summary of Non-Cognitive Skills

	Descriptive Statistics (1)				Estimated Change (2)	Correlation 2009 (3)
	mean	sd	min	max	in 2009 sd	Coefficient
Grit						
2009	0.599	0.133	0.188	0.906		
2015	0.666	0.136	0.344	1.000		0.2501**
Change	0.067	0.165	-0.344	0.812	0.5022***	-0.6039***
Conscientiousness						
2009	0.651	0.175	0.111	1.000		
2015	0.742	0.153	0.278	1.000		0.3498***
Change	0.090	0.188	-0.389	0.556	0.5163***	-0.6479***
Extraversion						
2009	0.692	0.214	0.000	1.000		
2015	0.700	0.214	0.111	1.000		0.5879***
Change	0.008	0.198	-0.500	0.556	0.0353	-0.4495***
Agreeableness						
2009	0.699	0.194	0.000	1.000		
2015	0.764	0.176	0.250	1.000		0.4610***
Change	0.065	0.193	-0.583	0.583	0.3368***	-0.5871***
Openness						
2009	0.622	0.181	0.167	1.000		
2015	0.622	0.172	0.222	0.944		0.4216***
Change	0.000	0.190	-0.611	0.611	0.0020	-0.5699***
Emotional Stability						
2009	0.492	0.198	0.056	1.000		
2015	0.571	0.192	0.111	0.944		0.4186***
Change	0.079	0.211	-0.500	0.556	0.3991***	-0.5602***

Notes: N=153. *** $p < 0.01$, ** $p < 0.05$.

The Grit measure is the sum of eight Likert-scale items (0-4) divided by 32.

The agreeableness measure is the sum of two Likert-scale items (0-6) divided by 12.

Each of the other Big Five measures is the sum of three Likert-scale items (0-6) divided by 18.

Authors' data.

Table 2: Transition Matrix (2009 $\mapsto$ 2015)

Grit	0–20%	20–40%	40–60%	60–80%	80–100%
0–20%	7.84	3.92	3.92	2.61	1.96
20–40%	8.50	5.23	5.88	3.92	3.27
40–60%	3.92	2.61	4.58	1.96	1.96
60–80%	3.92	3.27	1.96	3.92	5.88
80–100%	2.61	1.31	3.92	5.23	5.88
Conscientiousness	**0–20%**	**20–40%**	**40–60%**	**60–80%**	**80–100%**
0–20%	6.54	5.88	3.92	3.92	1.31
20–40%	8.50	5.88	1.96	3.27	1.31
40–60%	5.23	9.15	3.27	5.23	3.92
60–80%	2.61	1.96	0.65	5.23	2.61
80–100%	1.31	4.58	1.31	4.58	5.88
Extraversion	**0–20%**	**20–40%**	**40–60%**	**60–80%**	**80–100%**
0–20%	9.80	7.19	4.58	2.61	0.00
20–40%	6.54	7.84	5.23	3.27	2.61
40–60%	3.27	4.58	7.19	3.92	1.31
60–80%	1.31	0.65	2.61	3.92	2.61
80–100%	0.65	2.61	0.65	4.58	10.46
Agreeableness	**0–20%**	**20–40%**	**40–60%**	**60–80%**	**80–100%**
0–20%	7.84	8.50	1.96	1.96	0.00
20–40%	9.15	8.50	7.19	1.31	2.61
40–60%	1.31	3.92	4.58	0.00	2.61
60–80%	3.92	2.61	3.92	5.23	4.58
80–100%	0.65	1.96	5.88	4.58	5.23
Openness	**0–20%**	**20–40%**	**40–60%**	**60–80%**	**80–100%**
0–20%	7.84	5.23	2.61	3.27	1.31
20–40%	7.84	13.07	5.88	5.88	1.31
40–60%	2.61	4.58	1.96	1.96	0.65
60–80%	1.96	1.96	2.61	5.23	4.58
80–100%	1.31	2.61	1.31	5.88	6.54
Emotional Stability	**0–20%**	**20–40%**	**40–60%**	**60–80%**	**80–100%**
0–20%	8.50	9.80	3.27	3.27	0.65
20–40%	5.88	5.23	1.96	3.27	3.92
40–60%	2.61	7.19	2.61	3.27	3.92
60–80%	2.61	3.27	1.31	2.61	6.54
80–100%	0.65	3.92	3.27	5.88	4.58

Notes: N=153.

Authors' data.

Table 3: Reliable Change of Non-Cognitive Skills

	$r = .8$			$r = .7$		
	Decrease (%)	Unreliable (%)	Increase (%)	Decrease (%)	Unreliable (%)	Increase (%)
Grit	11.11	56.86	32.03	7.19	69.93	22.88
Conscientiousness	5.23	69.93	24.84	1.96	79.08	18.95
Extraversion	11.11	77.12	11.76	11.11	77.12	11.76
Agreeableness	6.54	73.20	20.26	6.54	73.20	20.26
Openness	13.07	73.20	13.73	8.50	83.66	7.84
Emotional Stability	11.11	58.17	30.72	9.15	67.97	22.88

Notes: N=153. Reliable change on 10% level.
Authors' data.

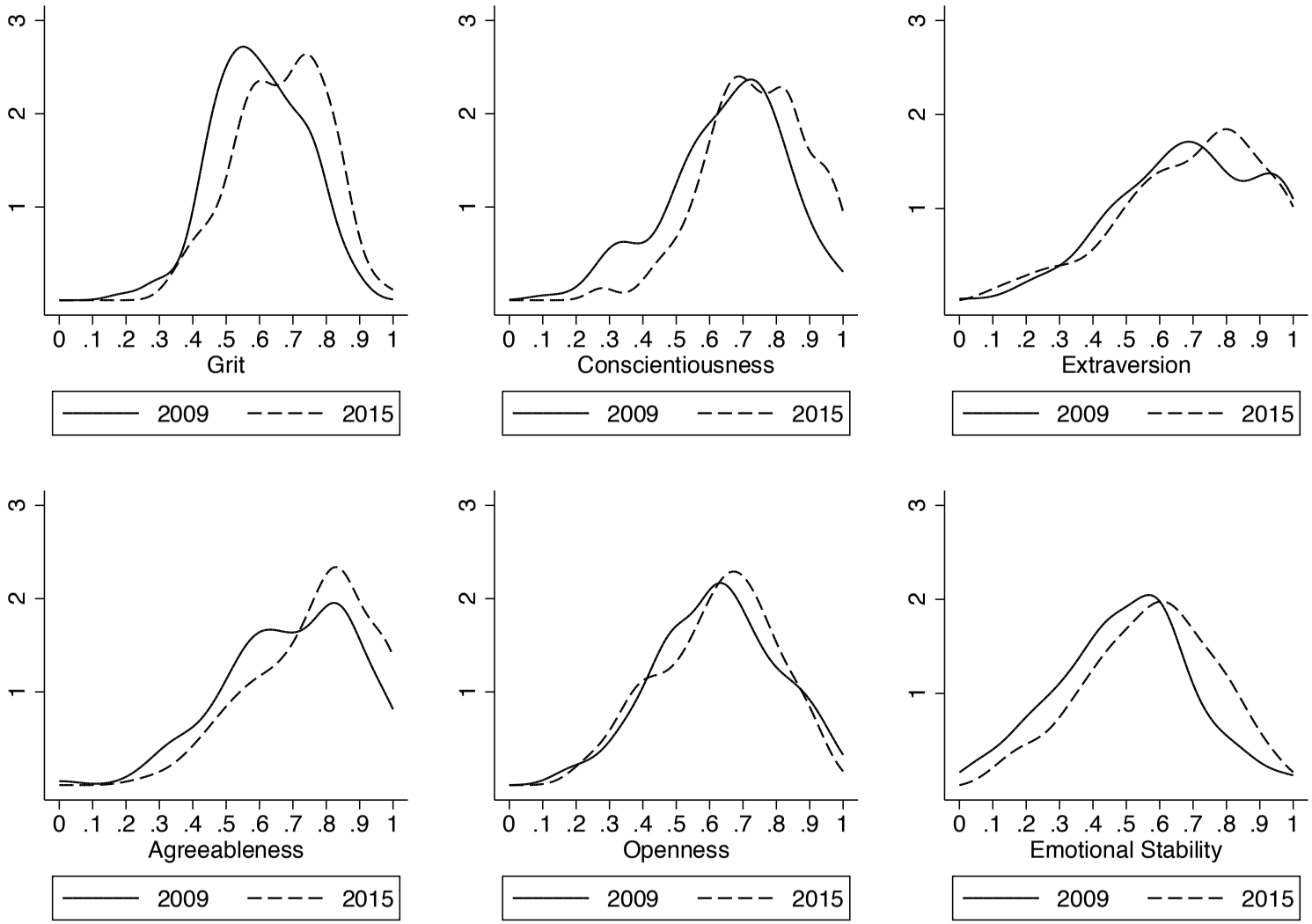

Figure 1: Probability Density Functions for Balanced Panel of Individuals

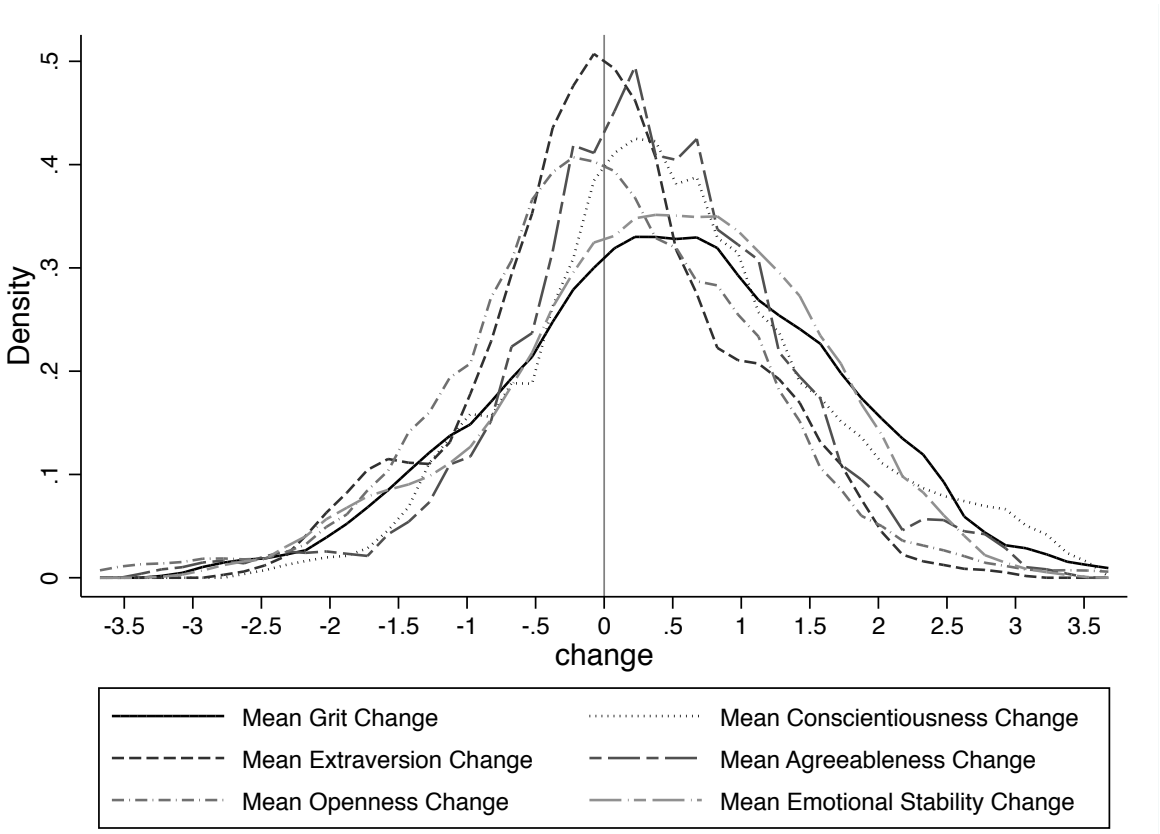

Figure 2: Density of Change Variable (standardized by sd of baseline score)

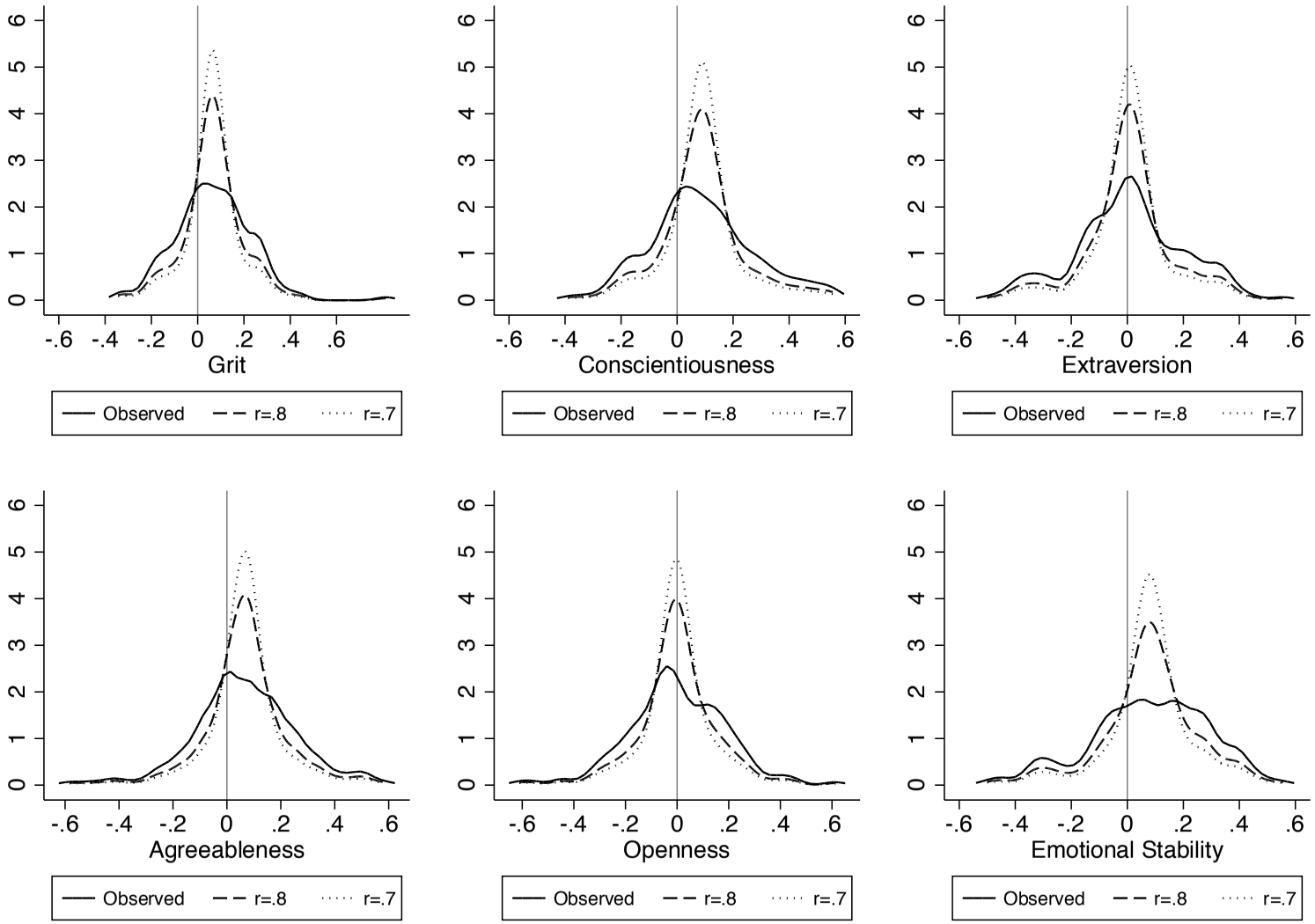

Figure 3: Density of Change Variable with Measurement Error (kernel=gaussian, bandwidth=0.04)

Online Appendix to "Development of Non-Cognitive Skills in Adolescence"

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A. Attrition Analysis

Table A1: Attrition Analysis

	OLS	Probit	OLS	Probit
Grit 2009	-0.0043	-0.0110	-0.0015	-0.0035
	(0.0087)	(0.0218)	(0.0090)	(0.0228
Conscientiousness 2009	-0.0052	-0.0131	-0.0060	-0.0158
	(0.0117)	(0.0301)	(0.0121)	(0.0314)
Extraversion 2009	-0.0041	-0.0104	-0.0032	-0.0082
	(0.0093)	(0.0240)	(0.0093)	(0.0245)
Agreeableness 2009	0.0049	0.0125	-0.0006	-0.0011
	(0.0146)	(0.0377)	(0.0153)	(0.0385)
Openness 2009	0.0089	0.0228	0.0079	0.0206
	(0.0105)	(0.0263)	(0.0106)	(0.0267)
Emotional Stability 2009	-0.0026	-0.0069	-0.0055	-0.0146
	(0.0088)	(0.0223)	(0.0091)	(0.0228)
Background Variables	NO	NO	YES	YES
Observations	255	255	252	252
R^2	0.008		0.025	

Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Coefficients are indicated. Robust standard errors are in parentheses. Dependent Variable: Being in the sample in 2015 (dummy variable). Background variables include being a native speaker, mother being highly educated, and high school math grade.

Authors' data.

B. Transition Matrix

Table A2: Transition matrix (2009 ↦ 2015) with reliability correction

Grit	0–20%	20–40%	40–60%	60–80%	80–100%
0–20%	7.84	3.92	3.92	2.61	1.96
20–40%	1.96	13.73	3.92	3.92	3.27
40–60%	1.96	0.00	10.46	0.65	1.96
60–80%	1.96	0.00	0.00	13.07	3.92
80–100%	2.61	1.31	1.31	0.00	13.73
Conscientiousness	**0–20%**	**20–40%**	**40–60%**	**60–80%**	**80–100%**
0–20%	7.84	4.58	3.92	3.92	1.31
20–40%	0.65	14.38	1.31	3.27	1.31
40–60%	1.31	0.00	21.57	0.00	3.92
60–80%	0.65	0.00	0.00	11.76	0.65
80–100%	1.31	0.65	0.65	0.00	15.03
Extraversion	**0–20%**	**20–40%**	**40–60%**	**60–80%**	**80–100%**
0–20%	16.34	1.96	3.27	2.61	0.00
20–40%	2.61	20.26	0.00	0.00	2.61
40–60%	3.27	0.00	15.69	0.00	1.31
60–80%	1.31	0.65	0.00	9.15	0.00
80–100%	0.65	2.61	0.00	0.00	15.69
Agreeableness	**0–20%**	**20–40%**	**40–60%**	**60–80%**	**80–100%**
0–20%	11.11	5.23	1.96	1.96	0.00
20–40%	0.00	22.22	2.61	1.31	2.61
40–60%	0.65	0.00	9.15	0.00	2.61
60–80%	3.92	0.00	0.00	16.34	0.00
80–100%	0.65	1.31	0.00	0.00	16.34
Openness	**0–20%**	**20–40%**	**40–60%**	**60–80%**	**80–100%**
0–20%	11.11	1.96	2.61	3.27	1.31
20–40%	1.96	27.45	0.00	3.27	1.31
40–60%	2.61	0.00	9.15	0.00	0.00
60–80%	1.96	0.65	0.00	13.73	0.00
80–100%	1.31	2.61	1.31	0.00	12.42
Emotional Stability	**0–20%**	**20–40%**	**40–60%**	**60–80%**	**80–100%**
0–20%	13.07	5.23	3.27	3.27	0.65
20–40%	0.00	12.42	0.65	3.27	3.92
40–60%	2.61	0.00	12.42	0.65	3.92
60–80%	2.61	0.00	0.00	10.46	3.27
80–100%	0.65	3.27	1.96	0.00	12.42

Notes: N=153. Unreliable changes ($r = .8$) are forced to be on the diagonal. Authors' data.

C. Observables and Changes

Table A3: Observables and Changes (OLS)

	(1) Change Grit (z-score)	(2) Change Conscientiousness (z-score)	(3) Change Extraversion (z-score)	(4) Change Agreeableness (z-score)	(5) Change Openness (z-score)	(6) Change Emotional Stability (z-score)
Nativespeaker	0.2281	-0.1252	0.0375	-0.3682	-0.3857	-0.2244
	(0.2167)	(0.2432)	(0.2407)	(0.2754)	(0.2523)	(0.2942)
Male	0.1281	-0.0041	-0.0044	0.1562	0.3422**	-0.1045
	(0.1578)	(0.1710)	(0.1751)	(0.1694)	(0.1624)	(0.1737)
One Sibling	-0.0575	0.1050	0.2039	0.0910	0.3072	0.1802
	(0.2583)	(0.3386)	(0.3011)	(0.3539)	(0.3060)	(0.3174)
Two Siblings	-0.2609	-0.0495	0.1454	-0.2053	0.0652	-0.0874
	(0.2572)	(0.3678)	(0.3172)	(0.3731)	(0.3194)	(0.3311)
Three or More Siblings	-0.0466	-0.0900	0.2543	-0.2787	0.3110	0.1560
	(0.2415)	(0.4079)	(0.3554)	(0.3917)	(0.3578)	(0.3784)
Father Highly Educated	-0.0899	0.0401	-0.0089	-0.0992	0.0377	0.2080
	(0.1731)	(0.1797)	(0.2051)	(0.1953)	(0.1686)	(0.1926)
Mother Highly Educated	0.1293	-0.2121	0.1271	0.3139	0.1517	0.0590
	(0.1664)	(0.1988)	(0.2298)	(0.1936)	(0.2138)	(0.2437)
Father Employed	0.0591	-0.4283	-0.4828	-0.2982	-0.1065	-0.0795
	(0.3403)	(0.2942)	(0.3381)	(0.4601)	(0.2484)	(0.3691)
Mother Employed	0.0730	0.0082	-0.0794	-0.0856	-0.1418	0.0355
	(0.1927)	(0.1863)	(0.1905)	(0.1979)	(0.2018)	(0.1961)
Parents Divorced	-0.0031	0.4674**	-0.2344	0.0679	0.3854*	0.0015
	(0.2170)	(0.2193)	(0.2412)	(0.1935)	(0.2114)	(0.2450)
R-squared	0.028	0.056	0.034	0.056	0.084	0.028
N	148	148	148	148	148	148

Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Coefficients are indicated. Robust standard errors are in parentheses. Base group for number of siblings: no siblings. Highly educated fathers and mothers received a tertiary degree. Employed fathers and mothers were employed in 2009. Divorced parents were divorced in 2009.

Authors' data.